Claims

1. Method for operating a multi-component injection moulding form tool in order to produce multi-layered formed bodies, whereby the multi-component injection moulding form tool features a hot runner nozzle with needle shut-off mechanism (36) used to release or block one inner jet chamber (3) and at least one outer jet chamber (5) of the nozzle needle (34) and, to that end, the needle shut-off mechanism (36) features a movable needle (37) and at least one first plunger (38) and one second plunger (39), arranged such that they are movable within a cylindrical barrel, whereby either plunger (38, 39) may be shifted by means of compression in such a manner that the needle (37) connected to these plungers (38, 39) may be brought into the corresponding releasing/blocking positions (I, II, III, IV), characterised in that the plastic forming material (new or barrier material) to be injected to form a thin layer, particularly a thin surface layer or barrier layer (component A or C), is directed through the innermost jet chamber (3) and the plastic forming material to be injected as the filler component (recycled material B or new material A) is directed through at least one outer jet chamber (5).

2. Method according to Claim 1, characterised in that, in the first step in the cycle, the shut-off needle (37) is brought into a position (I), wherein the innermost jet chamber (3) containing component A or C and at least one outer jet chamber (5) containing component B or A are opened, whereby, in the first step in the cycle, only component A or C is conveyed through the innermost jet chamber (3) and conveyance of the other components through at least one outer jet chamber (5) is stopped.

3. Method according to either Claim 1 or 2, characterised in that in order to produce a three-layered preform with a component B content (recycled material) of over 35 %, component B is conveyed through at least one outer jet chamber (5) in the second step in the cycle and the material shrunk during cooling is replaced with component B in the third step in the cycle, and, in order to complete the mould cycle, the shut-off needle (37) is brought into position III, wherein both the innermost jet chamber (3) and at least one outer jet chamber (5) are closed.

4. Method according to Claim 3, characterised in that, in the second step in the cycle, the shut-off needle (37) is brought into position II, wherein the innermost jet chamber (3) is blocked and at least one outer jet chamber (5) opened.

5. Method according to either Claim 1 or 2, characterised in that, in order to produce a three-layered or five-layered preform with a barrier material fabricated from C material, in the second step in the cycle, both component C and component B are conveyed through the innermost jet chamber (3) and at least one outer jet chamber (5) respectively, showing particularly a component C content of approx. 5% or less of the overall volume, and in that, in the third step in the cycle, conveyance of component C is interrupted in such a manner that only component B material is conveyed into the mould cavity from the outer jet chamber (5), and, in the fourth step in the cycle, the material shrunk during cooling is replaced with said component B, and, in order to complete the mould cycle, the shut-off needle (37) is brought into position III, wherein both the innermost jet chamber (3) and at least one outer jet chamber (5) are closed.

6. Method according to Claim 5, characterised in that the shut-off needle (37) is left in position I in the second and third steps in the cycle.

A 7. Method according to either Claim 1 ~~or 4~~, characterised in that, in order to produce a five-layered preform with an outer (66) and inner skin (65) fabricated from material A, a barrier layer fabricated from material C, particularly nylon, and a filler material B, particularly recycled material, in the first step in the cycle, the shut-off needle (37) is brought into position I, wherein the innermost jet chamber (3) containing component C and both the outer jet chamber containing component A and the jet chambers in between containing component B (recycled material) are opened, whereby conveyance of components B and C is stopped in the first step in the cycle and only component A is conveyed through the outer jet chamber, that conveyance of component A is stopped in the second step in the cycle and components B and C are conveyed at the same time, i.e. in the form of tubes, and, in the third step in the cycle, conveyance of component C is stopped and the plastic forming material shrunk during cooling is replaced with component B.

8. Method according to Claim 7, characterised in that a component C content of approx. 5 vol. % and a component B content of over 30 % of the overall volume is conveyed in the second step in the cycle.

SUB A1 > 9. Preform produced according to the method as claimed in Claim 3, characterised in that it shows a component B content (recycled material) of over 35 vol. %.

10. Preform produced according to the method as claimed in Claim 5, characterised in that the barrier layer composed of component C lies in the central wall structure of the preform.

11. Preform produced according to the method as claimed in Claim 7, characterised in that it shows a barrier layer of material C of less than approx. 5 vol. % and a material B content (recycled material) of over 35 vol. %.

12. Preform produced according to the method as claimed in Claim 7, characterised in that component A and component B are composed of the same material.

add C7